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# PATENT SPECIFICATION

331,297

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## COMPLETE SPECIFICATION

### Improvements in the Teat Cups of Milking Machines.

We, AMBROSE RIDD, a Subject of the King of Great Britain, Managing Director of Ridd Company (Australia) Proprietary Limited, of 167—169, King Street, Melbourne, in the State of Victoria, Commonwealth of Australia, and RIDD COMPANY (AUSTRALIA) PROPRIETARY LIMITED, of 167—169, King Street, Melbourne, aforesaid, a company duly organised under the Laws of the said State of Victoria, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to improvements in the teat cups of milking machines and refers especially to teat cups having flexible linings which are subjected alternately to the influence of vacuum and atmospheric pressure.

The object of the invention is to provide simple and efficient improvements in the flexible linings of teat cups of milking machines whereby milking operations can be more satisfactorily performed and without subjecting the teats or udders of cows to injury.

According to the invention there is provided a teat cup having an outer metal casing, a tapered flexible lining passing through the casing and having a rigid mouth piece fitted to the upper end thereof, longitudinally disposed ribs within the upper end of the lining, and nipples or pipe connections communicating with the lower part of the casing and the interior of the lining, wherein reinforcing means are provided integral with or attached to the sides of the lining towards the lower part thereof to stiffen the lining adjacent this part.

In one construction according to the invention the teat cup comprises an outer metal casing of cylindrical formation having a nipple depending from one side and an opening in the bottom thereof, a flexible lining or inflation located within the casing and having a tapered upper end and a cylindrical lower end, a collar or flange on the upper end of the lining adapted to rest upon the upper end of the casing, a second nipple detachably secured

within the lower end of the lining, a plurality of ribs disposed longitudinally on the inside of the tapered portion of the lining, flattened surfaces on the outside of the lining in line with the ribs, recesses in the flexible lining at the upper ends of the flattened surfaces, and a circumferentially disposed protuberance or reinforcing member surrounding the lower part of the tapered portion of the lining.

In order that the invention may be readily understood reference will now be had to the accompanying sheet of explanatory drawings wherein:—

Figure 1 is a view in sectional elevation of a teat cup constructed in accordance with the present invention.

Figures 2, 3 and 4 are views in sectional plan taken on the dotted lines 2—2, 3—3, and 4—4, respectively, of Figure 1.

Figure 5 is a view in sectional elevation of portion of a lining or inflation showing a slight modification in the construction thereof.

In these drawings the reference letter *a* designates the casing of the teat cup which is of cylindrical formation and at its lower end is provided with a depending nipple *b* to which is connected the vacuum pipes (not shown) of the system.

A flexible lining *c* passes through the said casing and the upper portion of the said lining is of tapered formation whilst the lower portion is cylindrical in shape and passes through a hole *d* in the bottom of the casing. The upper end of the flexible lining *c* is provided with a circumferential flange *e* which is adapted to seat upon the upper end of the casing and within the mouth of the said lining is fitted a ring *f* of metal or other approved material.

The flexible lining *c* tapers gradually from the flange *e* to a point *g* near the lower portion of the casing and from this point the said lining is of cylindrical formation. The interior of the flexible lining is formed with three longitudinally disposed ribs *h* and these ribs commence at a point near the circumferential flange and terminate just above the point *g*.

The interior of the flexible lining *c*

when viewed in sectional plan below the circumferential flange *e* conforms somewhat to the shape of a "trefoil" with the ribs *h* forming the cusps (see Figures 2 and 3 of the drawings).

The interior of the upper part of the lining is formed with three flat sides *i* and the centres of these flat sides lie in the radial planes in which the ribs *h* are located. The upper ends of the flattened side portions *i* of the flexible lining are formed with recesses *j* which ensure the said lining flexing easily under the influence of the alternating vacuum and atmospheric pressures within the teat cup (see Figure 2).

The lower part of the tapered portion of the lining is provided with a circumferentially disposed protuberance or reinforcing member *c* the object of which is to render this portion of the lining less flexible or sensitive to the influence of the variation in pressure between the lining and the casing than the portion of the lining located thereabove. The circumferentially disposed protuberance or reinforcing member may be constructed as shown in the drawings or in any other approved way, but, preferably it is formed integrally with the lining.

In Figure 1 of the drawings the reinforcing band or protuberance is disposed externally of the lining whilst in Figure 5 the band or protuberance is shown on the inside thereof.

The cylindrical lower end of the lining *c* passes through the hole *d* in the bottom end of the casing and a tapered bush or hollow plug *k*, having a nipple *l* depending therefrom, is inserted in the lower end of the lining.

The insertion of the tapering plug carrying the nipple *l* into the lower end of the lining causes the latter to be forced tightly against the sides of the hole *d* and prevents any leakage of air at this point between the lining and the casing.

The nipple depending from the tapered plug or sleeve is connected to the milk pipe of a claw (not shown) of the milking system in any approved way.

The metal ring *f* is provided with an outwardly projecting flange *m* which is engaged and retained in position by a recess formed within the mouth portion of the lining and this ring serves to prevent the mouth of the lining collapsing during the pulsations within the teat cup and it also ensures a constant tight fit between the lining and the upper end of the casing *a* surrounding the same.

The portions of the lining adjacent to the recesses *j* and the flat sides *i* of the lining are thinner than the other portions thereof thereby enabling the lining to

collapse readily when a vacuum is created within the lining and the space between the lining and the casing is arranged in communication with the atmosphere.

Due to the greater diameter of the upper portion of the lining and the recesses *j* the upper portion of the lining will collapse to a greater extent than the portion located therebelow and above the circumferentially disposed reinforcing protuberance, which protuberance serves to resist to some extent the undue collapsing of the lower part of the lining.

Thus, it will be understood that in use, the upper part of the lining collapses more easily than the lower part with the result that the collapsing of the lining proceeds more or less gradually from the upper to the lower end thereof and the reinforcing protuberance surrounding the lower portion of the lining offers sufficient resistance to the collapsing of the same to prevent an undue pressure being exerted on the lower part of the cow's teat.

The portion of the lining just above the point *g* can be reinforced by moulding a ring of fabric or like material therein or in any other approved way whereby this part of the lining will be prevented from collapsing as readily as the portion thereabove when a vacuum is created in the lining.

The teat cup according to the invention is simple in construction, is economical to manufacture, and in use will be found thoroughly efficient for the purpose for which it has been devised.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A teat cup having an outer metal casing, a tapered flexible lining passing through the casing and having a rigid mouth piece fitted to the upper end thereof, longitudinally disposed ribs within the upper end of the lining, and nipples or pipe connections communicating with the lower part of the casing and the interior of the lining, wherein reinforcing means are provided integral with or attached to the sides of the lining towards the lower part thereof to stiffen the lining adjacent this part.

2. A teat cup according to claim 1, wherein the upper portion of the lining is of tapered formation and the lower portion of the lining is of cylindrical formation and a reinforcing band or protuberance is formed on the outside, or inside of the lining at a point adjacent to the lower part of the tapered portion thereof.

3. A flexible lining for a teat cup having a downwardly tapering upper portion

and a cylindrical lower portion, longitudinal ribs within and flat sides on the exterior of the tapered portion of the lining, and recesses in the exterior of the lining above the flat sides, wherein a reinforcing member on the sides of the lining is located at the lower part of the tapered portion, the whole providing progressively greater flexibility from the reinforced part of the lining to the upper end thereof.

4. A teat cup consisting of the combination of parts constructed and arranged substantially as hereinbefore described with reference to and as illustrated in the drawings. 15

Dated this 15th day of April, 1929.

HY. FAIRBROTHER,  
Chartered Patent Agent,  
30 and 32, Ludgate Hill, London, E.C. 4.

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[This Drawing is a reproduction of the Original on a reduced scale.]

